Listing of Claims:

1.-40. (Canceled)

41. (Previously Presented) A method for transmitting a signal comprising:

inputting a bit stream;

selecting a signal constellation from a plurality of stored signal constellations, the selected signal constellation including a plurality of constellation points selected by maximizing a minimum Kullback-Leibler distance between the plurality of constellation points;

converting the input bit stream to symbols based on the selected signal constellation to encode the input bit stream in an amplitude of the symbols;

modulating a carrier wave in phase and amplitude in accordance with the symbols; and

transmitting the modulated carrier wave over a wireless channel;

wherein said selecting a signal constellation from a plurality of stored signal constellations is based on an indication of a number of transmit antennas used in transmitting the modulated carrier wave.

42. (Previously Presented) The method of claim 79, wherein the characteristic comprises a signal to noise ratio.

43.-44. (Canceled)

45. (Previously Presented) The method of claim 79, wherein the characteristic is determined from a signal received over the wireless channel.

46. (Canceled)

47. (Previously Presented) The method of claim 41, wherein the number of transmit antennas used in the transmitting is greater than one.

48. (Previously Presented) The method of claim 47, wherein the number of transmit antennas is included in a header of the message.

49. (Previously Presented) A device comprising:

a transmitter;

at least one antenna coupled to the transmitter for transmitting a signal over a wireless channel;

a processor, coupled to the transmitter;

a computer-readable medium including computer-readable instructions stored therein that, upon execution by the processor, perform operations comprising

selecting a signal constellation from a plurality of stored signal constellations based on an indication of a quantity of the at least one antenna, the selected signal constellation including a plurality of constellation points selected by maximizing a minimum Kullback-Leibler distance between the plurality of constellation points; and

converting the input bit stream to symbols based on the selected signal constellation to encode the input bit stream in an amplitude of the symbols; and

a modulator having an input coupled to an output of the processor and an output coupled to the antenna, the modulator configured to modulate a carrier wave in phase and amplitude in accordance with the symbols.

50. (Previously Presented) The device of claim 80, wherein the characteristic comprises a signal to noise ratio.

51.-52. (Canceled)

53. (Previously Presented) The device of claim 80, further comprising a receiver, wherein the characteristic is determined from a signal received over the wireless channel at the receiver.

54. (Previously Presented) The device of claim 49, wherein the at least one antenna comprises a plurality of transmit antennas.

55. (Previously Presented) The device of claim 54, wherein the number of the plurality of transmit antennas used in transmitting the signal is greater than one, and is determined from a message received over the wireless channel.

56. (Previously Presented) The device of claim 55, wherein the number of the plurality of transmit antennas is included in a header of the message.

57. (Previously Presented) A computer program of computer-readable instructions, tangibly embodied on a computer-readable medium and executable by a digital data processor to perform actions directed toward transmitting a signal, the computer-readable instructions configured to cause a device to:

select a signal constellation from a plurality of stored signal constellations, the selected signal constellation including a plurality of constellation points selected by maximizing a minimum Kullback-Leibler distance between the plurality of constellation points;

converting an input bit stream to symbols based on the selected signal constellation to encode the input bit stream in an amplitude of the symbols;

modulating a carrier wave in phase and amplitude in accordance with the symbols; and

transmitting the modulated carrier wave over a wireless channel;

wherein said selecting a signal constellation from a plurality of stored signal constellations is based on an indication of a number of transmit antennas used in transmitting the modulated carrier wave.

58. (Previously Presented) The computer program of claim 81, wherein the characteristic comprises a signal to noise ratio.

59.-60. (Canceled)

61. (Previously Presented) The method of claim 41, wherein the selected signal constellation comprises a plurality of sub-constellations.

62. (Previously Presented) The method of claim 61, wherein the plurality of sub-constellations comprise a plurality of points located on a surface of a plurality of concentric spheres.

63. (Previously Presented) The method of claim 61, wherein the plurality of sub-constellations comprise a plurality of points located at a plurality of latitudes on a surface of a sphere.

64. (Previously Presented) The method of claim 63, wherein the plurality of sub-constellations further comprise a second plurality of points located on a second surface of a second sphere concentric with the sphere.

65. (Previously Presented) The method of claim 61, wherein selecting the plurality of constellation points by maximizing a minimum Kullback-Leibler distance between the plurality of constellation points comprises maximizing a first minimum Kullback-Leibler distance between the plurality of sub-constellations and a second minimum Kullback-Leibler distance between a plurality of points of each sub-constellation.

66. (Previously Presented) The device of claim 49, wherein the selected signal constellation comprises a plurality of sub-constellations.

67. (Previously Presented) The device of claim 66, wherein the plurality of sub-constellations comprise a plurality of points located on a surface of a plurality of concentric spheres.

68. (Previously Presented) The device of claim 66, wherein the plurality of sub-constellations comprise a plurality of points located at a plurality of latitudes on a surface of a sphere.

69. (Previously Presented) The device of claim 68, wherein the plurality of sub-constellations further comprise a second plurality of points located on a second surface of a second sphere concentric with the sphere.

70. (Previously Presented) The device of claim 66, wherein selecting the plurality of constellation points by maximizing a minimum Kullback-Leibler distance between the plurality of constellation points comprises maximizing a first minimum Kullback-Leibler distance between the plurality of sub-constellations and a second minimum Kullback-Leibler distance between a plurality of points of each sub-constellation.

71. (Previously Presented) The computer program of claim 57, wherein the selected signal constellation comprises a plurality of sub-constellations.

72. (Previously Presented) The computer program of claim 71, wherein the plurality of sub-constellations comprise a plurality of points located on a surface of a plurality of concentric spheres.

73. (Previously Presented) The computer program of claim 71, wherein the plurality of sub-constellations comprise a plurality of points located at a plurality of latitudes on a surface of a sphere.

74. (Previously Presented) The computer program of claim 73, wherein the plurality of sub-constellations further comprise a second plurality of points located on a second surface of a second sphere concentric with the sphere.

75. (Previously Presented) The computer program of claim 71, wherein selecting the plurality of constellation points by maximizing a minimum Kullback-Leibler distance between the plurality of constellation points comprises maximizing a first minimum Kullback-Leibler distance between the plurality of sub-constellations and a second minimum Kullback-Leibler distance between a plurality of points of each sub-constellation.

76. (Previously Presented) The method of claim 41, wherein the plurality of stored signal constellations is stored as at least one of a look-up table or an algorithm.

77. (Previously Presented) The device of claim 49, wherein the plurality of stored signal constellations is stored as at least one of a look-up table or an algorithm.

78. (Previously Presented) The computer program of claim 57, wherein the plurality of stored signal constellations is stored as at least one of a look-up table or an algorithm.

79. (Previously Presented) The method of claim 41, further comprising determining a characteristic of the wireless channel, wherein said selecting a signal constellation from a plurality of stored signal constellations is based on the determined characteristic.

80. (Previously Presented) The device of claim 49, wherein the computer-readable medium further includes computer-readable instructions stored therein that, upon execution by the processor, perform operations comprising determining a characteristic of the wireless channel.

81. (Previously Presented) The computer program of claim 57, wherein the computer-readable instructions are further configured to cause a device to determine a characteristic of the wireless channel.